

PROGRAM GGMT 2022



WORLD
METEOROLOGICAL
ORGANIZATION



GLOBAL
ATMOSPHERE
WATCH

18-21 September 2022

Hotel Wageningsche Berg, Wageningen

Plenary sessions: Bosrand room

Poster session: Boomgaard room

Vendors exhibiting: Picarro, Thermo Fischer, ACOEM, Licor, Aerodyne

Sunday 18 September

08:00 - 12:00	IG3IS Steering committee	Meidoorn room
19:00 - 21:00	Icebreaker reception (sponsored by Picarro)	Arboretum room

Monday 19 September

08:00 - 12:00	SAG meeting	Meidoorn room	
12:00 - 13:00	SAG Lunch		
	Abstract #		Online
13:00 - 13:10	Opening GGMT 2022	Oksana Tarasova, Alex Vermeulen	
13:10 - 15:00	Session: Quality assurance of greenhouse gas measurements; 8 talks 10+2 mins; 14 minutes general discussion	Chair: Paul Brewer	
13:10	88 Chasing the WMO CO2 Compatibility Goal around the Southern Ocean	Britton Stephens	
13:22	80 The Sausage ICP: 20 years of inter-laboratory flask-air comparison data	Armin Jordan	
13:34	66 Comparison of atmospheric greenhouse gas measurements at two intake heights at the monitoring stations Zugspitze and Schauinsland in Germany	Antje Hoheisel	
13:46	62 Metrology Lab of the ICOS Atmospheric Thematic Center: Role in ICOS and platform for GHG instrument performance assessment.	Olivier Laurent	
13:58	46 Progress on understanding the stability and transfer uncertainty of scales maintained by the CCL at NOAA	Andrew Croftwell	
14:10	34 On-demand comparisons of CO2 in air standards and scale relationships	Robert Wielgosz	
14:22	14 Comparisons of non-CO2 trace gas measurements between AGAGE and NOAA at common sites	Paul Krummel	X
14:34	11 What can we learn from over 100 audits in 25 years regarding accurate measurements of greenhouse gases?	Christoph Zellweger	
15:00 - 15:30	tea/coffee break		
15:30 - 16:15	Session: Advances in the traditional greenhouse gas measurement techniques; 3 talks 10+3 mins; 6 minutes general discussion	Chair: Samuel Hammer	
15:30	45 Detection of Hazardous Air Pollutants and Greenhouse Gases at Ultra-trace Levels using Broad Band Cavity Ring Down Spectroscopy	Gregor Lucic	
15:43	5 Development of fluorinated greenhouse gases and ozone depletion substances (ODS) measurement system and application in Chinese observation network	Bo Yao	X
15:56	151 The urgent need for standardization of $\Delta 17\text{O}$	Getachew Adnew	
16:15 - 17:00	Session: Measurements and quality assurance for 14C, O2/N2 and related tracers; 3 talks 10+3 mins; 6 minutes general discussion	Chair: Sylvia Michel	
16:15	42 Gravimetric Constraints on the Absolute Stability of the SIO O2 Program $\delta(\text{O}_2/\text{N}_2)$ Scale	Eric Morgan	
16:28	13 Measuring atmospheric O2 and CO2 gradients above a boreal forest to derive O2 and CO2 fluxes and ER signals	Kim Faassen	
16:41	10 Updated assessment of $\Delta 14\text{CO}_2$ measurement intercomparability using atmospheric records and standard materials	Christian B. Lewis	

Tuesday 20 September

08:30 - 10:30	Session: Emerging Observation Techniques including low-cost sensors, Remote Sensing and Integration of Observations I; 8 talks 10+3 mins; 16 minutes general	Chair: David Griffith	
08:30	83 Beyond the GGMT Greenhouse Gas Measurement Guidelines: Guidelines for National and Urban Greenhouse Gas Emission Monitoring and Assessment	Jocelyn Turnbull	
08:43	75 Comparing emerging methods for source identification and emission quantification of methane emissions at municipal solid waste landfills	Felix Vogel	
08:56	59 High-precision airborne measurements of N2O, CH4, CO2, CO using active AirCore	Huilin Chen	X
09:09	39 MIRO Analytical's MGA10: A single device for greenhouse gas and air quality monitoring	Morten Hundt	X
09:22	32 UAV atmospheric mapping applications using an improved low-cost NDIR sensor	Yunsong Liu	
09:35	22 Non-Contact, Low-Cost Regional Greenhouse Gases Detection via 3D Laminated Graphene-Based Photoelectric Construct	Young-Suk Oh	

09:48	6	Assimilation of methane plume data with grid-scale emissions maps from atmospheric inversions.	Sudhanshu Pandey	X
10:01	2	Laser dispersion spectroscopy for next generation emissions monitoring	Rob Gibbs	
10:30 - 11:00 coffee break				
11:00 - 12:00 Session: Urban and regional scale transport and inverse modeling I; 4 talks 10+3 mins; 8 minutes general discussion Chair: Jocelyn Turnbull				
11:00	81	MACARON : Marseille-Aix-en-Provence metropolis Carbon Atmospheric Research program and Observation Network for improving CO2 and CH4 emission estimates.	Irène Xueref-Remy	X
11:13	79	Updates from the Los Angeles Megacity Carbon Project	Jooil Kim	
11:26	53	Dense Monitoring Networks to Observe Greenhouse Gases in Korea	Eunhae Jeong Lim Jaehyun	
11:39	24	ICOS Cities Integrated city observatories for innovative greenhouse gas measurements	Claudio D'Onofrio	
12:00 - 13:00 Lunch				
13:00 - 13:40 Session: Urban and regional scale transport and inverse modeling II; 3 talks 10+3 mins; 11 minutes general discussion Chair: Felix Vogel				
13:00	23	CSIRO Aspendale site move: Implications and opportunities.	Ann Stavert	X
13:13	8	Mapping urban emissions of CO2	Ronald Cohen	
13:26	1	Carbon Cycle Research activities by setting up GHG concentration and flux observation network in India	Yogesh K. Tiwari	
13:40 - 15:00 Session: The WMO GHG Initiative, introduction and discussion				
15:00 - 15:30 tea/coffee break				
15:30 - 18:00 Poster session, 3 minutes recorded flash talks per on-line poster				
18:00 - 19:00 Moderated comments/questions on posters per zoom				
19:30 - late Conference dinner				

Wednesday 21 September

08:30 - 10:30 Session: Quality assurance of the measurements of the stable isotopes; 8 talks 10+3 mins; chair: John Miller, Lin Huang 16 minutes general discussion				
08:30	94	INT7020 project: Developing Capacity towards the Wider Use of Stable Isotopic Techniques for Source Attribution of Greenhouse Gases in the Atmosphere	Katherina Deufrains	
08:43	86	Quantifying combined uncertainties of $\delta^{13}\text{C}$ -CO ₂ & $\delta^{18}\text{O}$ -CO ₂ from 20-year calibration datasets: how good could we achieve in realization of VPDB-CO ₂ scale via NBS19 etc. carbonates?	Lin Huang	
08:56	85	The revised INSTAAR data set for $\delta^{13}\text{C}$ -CO ₂ : How do we measure up to other stable isotope laboratories, and how can we work together to make the most of our data?	Sylvia Michel	
09:09	73	Reaching compatibility targets for $\delta^{13}\text{C}$ of air-CO ₂ and methane: mission impossible or possible?	Sergey Assonov	X
09:22	55	Comparison of $\delta^{13}\text{C}$ -CO ₂ and $\delta^{18}\text{O}$ -CO ₂ measurements: An update of the results from the IAEA CLASSIC experiment and the WMO round robins.	Colin Allison	X
09:35	36	Assessment of international standards on the carbon isotope VPDB scale	Heiko Moosen	
09:48	3	Gas reference materials for underpinning measurements of $\delta^{13}\text{C}$ -CO ₂ and $\delta^{18}\text{O}$ -CO ₂ with traceability to the VPDB scale	Paul Brewer	
10:01	49	Laboratory comparison and progress on the development of community reference gases for carbon and hydrogen isotope ratios in atmospheric CH ₄	Peter Sperlich	
10:30 - 11:00 coffee break				
11:00 - 12:45 Session: Data products and utilization of the observations; 8 talks 10+2 minutes; 10 minutes general discussion chair: Alex Vermeulen				
11:00	77	30 years of atmospheric methane measurements at Schauinsland Stations in southern Germany : Analysis of trends in mole fraction and emissions derived with radon-tracer method	Martina Schmidt	
11:12	67	Utilising vertical gradient information of greenhouse gases and meteorological measurements at eight German atmospheric ICOS Stations	Jennifer Müller-Williams	X
11:24	60	Historical CO ₂ and CH ₄ time series on the European continent	Michel Ramonet	
11:36	54	Looking inside the carbon sequestration of bamboo forests in Anji (China) with an observation-based approach	Shuangxi Fang	X
11:48	19	Community tools for developing integrated observation sets: ICP2 and Obspack	John Mund	
12:00	18	Amazonia as a case study to compare measurements and inventories	Luciana Gatti	X
12:12	17	A view of the European carbon flux landscape through the lens of the ICOS atmospheric observation network	Ida Storm	
12:24	5	Long-term changes in CH ₄ emission: Comparing $\Delta\text{CH}_4/\Delta\text{CO}_2$ ratios between observation and proved model in East Asia (2010–2020)	Samuel Takele Kenea	
12:45 - 13:45 Lunch				
13:45 - 15:00 Session: Observations from the mobile platforms (aircraft, drone, balloon, etc) and over/in the ocean; 6 talks 10+2 mins; 3 minutes general discussion chair: Colm Sweeney				

13:45	90 Greenhouse gas measurements onboard the Research Vessel Investigator – GAW's first mobile observatory	Zoe Loh	X
13:57	89 A multi-pronged effort needed to enhance measurements of GHG vertical profiles	Colm Sweeney	
14:09	87 Progress Toward a NOAA Commercial Aircraft Greenhouse Gas Measurement Program	Kathlyn McKain	X
14:21	76 Performance assessment of the mobile g4301 cavity ring-down spectroscopy analyzer and practical feedback from field measurements	Magdalena Hofmann	
14:33	44 The NOAA High-altitude Operational Returning Uncrewed System (HORUS) for Atmospheric Observing	Bianca Baier	X
14:45	16 Analysis of source distribution of high carbon monoxide and aerosol events using airborne and surface observations in South Korea	Shanlan Li	
15:00 - 15:30 tea/coffee break			
15:30 - 16:45	Recommendations	chair: Felix Vogel + chapter leads	
16:45 - 17:00	Closing of the meeting		

Posters

nr Abstract #

Quality assurance of greenhouse gas measurements

1	25 Towards implementing an optical method for N ₂ O analysis at the CCL	Brad Hall	
2	28 A study on equivalence evaluation for continuous measurements of greenhouse gases with GC analysis method	Jungil Lee	
3	56 Development of a centralized quality management system for ICOS Atmosphere	Michel Ramonet	
4	48 Influence of fractionation of CO ₂ and air during preparation of a standard mixture	Nobuyuki Aoki	X
5	50 WCC and QA/SAC activities and GHG observation by JMA	TAKATSUJI Shinya	
6	92 QA/SAC Switzerland and QA/SAC Japan contributions to the quality of GAW's greenhouse gas observations	Martin Steinbacher	

Quality assurance of the measurements of the stable isotopes

7	31 International comparison of isotope ratio measurement capabilities for CO ₂ : From pure CO ₂ to CO ₂ in air samples	Joële Viallon	
8	40 Long-term performance of a dual-laser absorption spectrometer for measurement of $\delta^{13}\text{C}$, $\delta^{18}\text{O}$, and $\Delta^{17}\text{O}$ of CO ₂	P. M. Steur	
9	47 A new system to measure N ₂ O site preferences in air samples, demonstrated on N ₂ O extracted from agricultural drainage waters	Peter Sperlich	
10	33 Measurements of stable carbon isotope ratio of methane at Hateruma Station, Japan	Taku Umezawa	X

Measurements and quality assurance for 14C, O₂/N₂ and related tracers

11	64 Tracking the origins of atmospheric CO ₂ in Seoul, South Korea using 14C and 13C	Chaerin Park	
12	30 Development of a dynamic calibration system for COS in air mixture at ambient levels	Hideki Nara	X
13	35 Re-evaluation of long-term atmospheric 14CO ₂ records of the Heidelberg cooperative background air sampling network	Samuel Hammer	

Data products and utilization of the observations

14	7 Identifying bulk regional methane isotopic signatures using long-term records from UK sites	Ceres A. Woolley Maisch	
15	58 Measurements of atmospheric CH ₄ at regional stations of Korea Meteorological Administration/ Global Atmosphere Watch Programme: characteristics and long-term changes	Haeyoung Lee	
16	12 Estimation of CO ₂ , CH ₄ , CO and gaseous elemental mercury fluxes over southern Africa using the radon tracer method	Hippolyte Leuridan	?
17	15 Evaluation of regional atmospheric CO ₂ inverse modeling over Asia	Jeongmin Yun	
18	52 Adding DOI to observation data and enhancing WDCGG website functions	Atsuya Kinoshita	
19	51 40 years of atmospheric CO ₂ measurements in Hungary	Laszlo Haszpra	
20	38 Seven years of measurements of atmospheric methane at the Chacaltaya GAW regional station	Laura Ticona	X
21	74 Evaluation of two algorithms for the automatic identification of spikes on continuous atmospheric observations of CO ₂ , CH ₄ and CO	Paolo Cristofanelli	
22	61 The characteristics of atmospheric SF ₆ and emission changes during 2017-2020 in Korean Peninsula	Soojeong Lee	
23	26 Monitoring large CO ₂ emissions on a facility-level by satellite	Yeonsoo Kim	
24	91 Retrieving the global mean surface CO ₂ level from the GAW in-situ network	Zhendong Wu	X

Advances in the traditional greenhouse gas measurement techniques

25	70	A new compressor system based on a Resato gas booster replacing the Rix SA-models for filling whole air reference cylinders	Bert Scheeren	
26	27	Side by side comparisons of FTIR and CRDS analysers for CO ₂ and CH ₄ in air: persistent biases and dealing with water vapour	David Griffith	
Emerging Observation Techniques including low-cost sensors, Remote Sensing and Integration of Observations				
27	20	EM27/SUN Measurements of Greenhouse Gases in Seoul	Hayoung Park	
28	37	OBS4CLIM: French investment for an Integrated Observing System for the Atmosphere - Description of the greenhouse gases component	Michel Ramonet	
29	43	Urban and tropical EM27/SUN network for satellite validations, observations and verification of greenhouse gas emissions	Simona Latchabady	
30	71	NIST Low-Cost Sensor Greenhouse Gas Measurement Project	Tyler Boyle	X
Observations from the mobile platforms (aircraft, drone, balloon, etc) and over/in the ocean				
31	29	High methane sources in the outskirts of metropolitan areas are detected by aircraft and mobile observations	Dong Yeong Chang	
32	9	Vertical profile of greenhouse gases (CO ₂ , CH ₄ , CO, N ₂ O, H ₂ O) from surface up to 35 km with Aircore: long term monitoring program at Trainou, France.	Julien Moyé	
33	68	Greenhouse gases measurements in Southern Ocean onboard the Marion Dufresne	Marc Delmotte	
34	78	Quantification of methane emission rates in southern Germany using mobile measurements	Martina Schmidt	
35	82	Mobile methane measurement in UK cities - partitioning sources and comparing spectroscopic analysers	Rebecca Fisher	
36	65	High-resolution CO ₂ , CH ₄ , and NO _x maps from urban to rural areas using mobile monitoring	Sojung Sim	
Urban Observations and Networks				
37	71	The NIST Northeast Corridor Tower GHG Network	Anna Karion	X
38	57	Characterizing regional methane emissions from the oil and gas sector using non-methane hydrocarbons	Germain-Piaulenne Emeric	
39	69	Characteristics of Atmospheric Greenhouse Gases in Urban and Background Areas in Korea	Insun Kim	X
40	21	Source attribution of urban methane in Seoul, South Korea	Jaewon Joo	
41	41	The Parisian component of ICOS Cities	Michel Ramonet	
42	63	Design and performance assessment of "Mid Cost" CO ₂ sensor system for urban monitoring network	Olivier Laurent	
43	84	Status of the New Zealand atmospheric greenhouse gas observation network	Gordon Brailsford	